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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,531	10/26/2001	Ken A. Nishimura	100100321-1	2565

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EXAMINER	
LEE, DAVID J	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/007,531	NISHIMURA ET AL.	
	Examiner	Art Unit	
	David Lee	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-34,36-40,43-45 and 48-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29,30,33,34,36-39,43,44 and 48-51* is/are rejected.

7)☒ Claim(s) *31,32,40,45 and 52-55* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 29, 34, 38, and 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdogan et al. (US Pub. No. 2002/0024704 A1) in view of Olsson et al. (US Patent No. 6,765,670 B1).

Regarding claims 29 and 38, Erdogan teaches a system for performing time-domain equalization, the system comprising: a beamsplitter configured to split a first optical signal comprising a light pulse into a plurality of beams (74 of fig. 12); a birefringent component configured to receive the first beam and the second beam and operable to optically scale the first and second beams by providing a first rotation of a polarization plane of the first beam and a second rotation of a polarization plane of the second beam (60_1 and 60_2 of fig. 12); a walk-off crystal configured to split each of the optically scaled first and second beams into a first and a second pair of beams (PBS of fig. 12 is considered a walk off crystal in that it performs the claimed function of splitting each of the first and second beams); and an array of photodetectors comprising a first and a second pair of photodetectors configured to receive the first and the second pair of beams respectively and generate therefrom a first and a second electrical component of an electrical signal that corresponds to the input optical signal after time-domain equalization (detector array not shown, but see, e.g., detectors in figs. 11, 13; see also 40 of fig.

4). Erdogan does not expressly disclose a spectrometer module/signal monitoring function. However, it is well known to incorporate spectrometry and monitoring functions in communication systems in order to decrease the risk for network faults and to keep track of signals and to report when errors occur (e.g., see col. 1, lines 19-37 of Olsson). A skilled artisan would have been motivated to incorporate the spectrometer module of Olsson in order to measure properties of the optical signal (see col. 2, lines 18-22). It would have been obvious to a skilled artisan at the time of invention to incorporate the module in the system of Erdogan in order to provide data and signal quality monitoring capabilities so as to increase system reliability and performance. Olsson also discloses that "by using a variable DGD [differential group delay] element in a spectrometer module, it is possible to perform measurements on an incoming optical light signal, for detecting parameters such as polarization state and degree of polarisation as a function of the wavelength of the incoming signal" (col. 2, lines 36-40; see also DGD element 511 of fig. 2). Following this teaching, it would have been obvious to a skilled artisan at the time of invention to incorporate a differential group delay component in the spectrometer module in order to extend detection and monitoring capabilities and further increase system reliability. Note that this DGD element would be coupled to the beamsplitter of Erdogan and that each link exiting the 3dB coupler of Erdogan would have monitoring capabilities (see, e.g., fig. 2 of Olsson – two links are shown to include DGD elements 511 and 517 with associated monitoring capabilities).

Regarding claim 34, Erdogan teaches that the rotation of the polarization plane determines the intensity of beams in the first pair of beams (APC of fig. 12: depending on the intensity distribution, rotating the plane will produce different intensities).

Regarding claims 48, 49, Erdogan teaches a system for performing time-domain equalization, the system comprising: a beamsplitter configured to split a first optical signal comprising a light pulse into a plurality of beams (74 of fig. 12); a birefringent component configured to receive the first beam and the second beam and operable to use first and second scaling coefficients to set the first and second beams to a first and second intensity (60_1 and 60_2 of fig. 12: the "scaling coefficients" are considered to be the amount of rotation of the polarization plane provided by the APC; note that the amount of rotation determines the intensity); a walk-off crystal configured to split each of the optically scaled first and second beams into a first and a second pair of beams (PBS of fig. 12 is considered a walk off crystal in that it performs the claimed function of splitting each of the first and second beams); and an array of photodetectors comprising a first and a second pair of photodetectors configured to receive the first and the second pair of beams respectively and generate therefrom a first and a second electrical component of an electrical signal that corresponds to the input optical signal after time-domain equalization (detector array not shown, but see, e.g., detectors in figs. 11, 13; see also 40 of fig. 4). Erdogan does not expressly disclose a spectrometer module/signal monitoring function. However, it is well known to incorporate spectrometry and monitoring functions in communication systems in order to decrease the risk for network faults and to keep track of signals and to report when errors occur (e.g., see col. 1, lines 19-37 of Olsson). A skilled artisan would have been motivated to incorporate the spectrometer module of Olsson in order to measure properties of the optical signal (see col. 2, lines 18-22). It would have been obvious to a skilled artisan at the time of invention to incorporate the module in the system of Erdogan in order to provide data and signal quality monitoring capabilities so as to increase

system reliability and performance. Olsson also discloses that "by using a variable DGD [differential group delay] element in a spectrometer module, it is possible to perform measurements on an incoming optical light signal, for detecting parameters such as polarization state and degree of polarisation as a function of the wavelength of the incoming signal" (col. 2, lines 36-40; see also DGD element 511 of fig. 2). Following this teaching, it would have been obvious to a skilled artisan at the time of invention to incorporate a differential group delay component in the spectrometer module in order to extend detection and monitoring capabilities and further increase system reliability. Note that this DGD element would be coupled to the beamsplitter of Erdogan and that each link exiting the 3dB coupler of Erdogan would have monitoring capabilities (see, e.g., fig. 2 of Olsson – two links are shown to include DGD elements 511 and 517 with associated monitoring capabilities).

Regarding claim 50, Erdogan does not specifically disclose that the coefficients are "equal to one of a) +1, b) –1, and c) 0." However, absent any teaching of criticality, it would have been a matter of design choice, or given the general environment of the prior art, it would have been obvious to obtain an optimal or requested value by routine experimentation. Therefore, a coefficient equal to one of a) +1, b) –1, and c) 0 would have been attainable for one skilled in the art.

Claims 33, 36, 37, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdogan in view of Olsson and in further view of admitted prior art.

Regarding claim 33 and 51, Erdogan does not specifically disclose that the birefringent component comprises an array of liquid crystal cells. However, it is well known to provide

polarization rotation in birefringent components as indicated by admitted prior art. It is taken to be admitted prior art because applicant failed to traverse examiner's assertion of official notice. See MPEP 2144.03[R-1]. It would have been obvious to a skilled artisan at the time of invention to use liquid crystal cells in the birefringent component in order to provide accurate and efficient polarization rotation.

Regarding claims 36 and 37, Erodgan does not expressly disclose that the first optical signal originated from a polarization splitter. However, polarization beam splitters in network configurations are well known as indicated by admitted prior art. It is taken to be admitted prior art because applicant failed to traverse examiner's assertion of official notice. See MPEP 2144.03[R-1]. It would have been obvious to a skilled artisan at the time of invention to include a polarization beam splitter to transmit signals to their desired destinations. Note that the polarizations of split signals can be configured to have different polarizations.

Claims 30, 39, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erdogan in view of Olsson and in further view of Epworth (US Patent No. 6,271,952).

Regarding claims 30, 39, 44, the combined invention of Erdogan and Olsson teaches the limitations of claims 29 and 38 but does not expressly disclose a control system configured to control the birefringent component for rotation of the polarization plane of the first beam, wherein the rotation provides an optical scaling of the delayed first beam. Epworth, from a similar field of endeavor, discloses a birefringent component configured to rotate a polarization plane of a beam (6 of fig. 2) and a walk-off crystal configured to receive the beam and split the beam into a first pair of beams (8 of fig. 2), further comprising a control system (10 of fig. 2)

configured to control the birefringent component for rotation of the polarization plane of the first beam wherein the rotation provides an optical scaling of the delayed first beam (see col. 5, lines 16-30). It would have been obvious to a skilled artisan at the time of invention to use the control system of Epworth to control the birefringent component of the beam in the system of Erdogan in order to increase signal quality and provide flexible rotation coefficients.

Regarding claim 43, the combined invention of Erdogan, Olsson and Epworth teaches the limitations of claims 30, 33, and 38, but does not expressly disclose that the birefringent component under control is an array of liquid crystal cells. However, the use of liquid crystal cells is well known and widely used in providing polarization rotation in birefringent components as indicated by admitted prior art. It is taken to be admitted prior art because applicant failed to traverse examiner's assertion of official notice. See MPEP 2144.03[R-1]. It would have been obvious to a skilled artisan at the time of invention to use liquid crystal cells in the birefringent component in order to provide accurate and efficient polarization rotation.

Allowable Subject Matter

2. Claims 31, 32, 40, 45, 52-55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER